

What is Claimed is:

1. A method for displaying geographic track data and geographic position data for a train, said method comprising:
 - employing a geographic information system database;
 - entering static track data in said geographic information system database;
 - determining a track section occupied by said train;
 - determining geographic starting and ending positions of said track section;
 - displaying geographic information regarding said static track data from said geographic information system database;
 - determining geographic information regarding said track section occupied by said train from said geographic starting and ending positions of said track section and from said geographic information system database; and
 - displaying said geographic information regarding said track section occupied by said train with said geographic information regarding said static track data.
2. The method of Claim 1 further comprising:
 - determining said track section occupied by said train from a computer aided dispatching system.
3. The method of Claim 2 further comprising:
 - storing representations of a plurality of track sections in a first non-geographically based track layout database associated with said computer aided dispatching system; and
 - storing geographical coordinates associated with each of said track sections in a second database.
4. The method of Claim 3 further comprising:
 - storing a first longitude, a first latitude, a second longitude and a second latitude for each of said track sections in said second database.
5. The method of Claim 4 further comprising:
 - employing as said first longitude a starting longitude;
 - employing as said first latitude a starting latitude;

employing as said second longitude an ending longitude; and employing as said second latitude an ending latitude.

6. The method of Claim 5 further comprising:
employing as said second database a track infrastructure database;

including in said track infrastructure database a plurality of records, with one of said records being associated with a corresponding one of said track sections; and

including with each of said records a record identifier, an identifier of said corresponding one of said track sections, said starting latitude, said starting longitude, said ending latitude and said ending longitude.

7. A method for displaying geographic roadway data, geographic track data, and geographic position data for a train, said method comprising:

employing a geographic information system database;
entering static roadway data in said geographic information system database;

entering static track data in said geographic information system database;

determining a track section occupied by said train;
determining geographic starting and ending positions of said track section;

displaying geographic information regarding said static roadway data and said static track data from said geographic information system database;

determining geographic information regarding said track section occupied by said train from said geographic starting and ending positions of said track section and from said geographic information system database; and

displaying said geographic information regarding said track section occupied by said train with said geographic information regarding said static roadway data and said static track data.

8. The method of Claim 7 further comprising:
storing a starting longitude, a starting latitude, an ending longitude and an ending latitude for each of said track sections in another database; and

determining geographic information regarding said track section occupied by said train from said starting longitude, said starting latitude, said ending longitude and said ending latitude of said track section occupied by said train and from said geographic information system database.

9. The method of Claim 8 further comprising:
determining a plurality of nodes between a first node defined by said starting longitude and said starting latitude and a second node defined by said ending longitude and said ending latitude of said track section occupied by said train from said geographic information system database; and

displaying a plurality of lines between said nodes as said geographic information regarding said track section occupied by said train.

10. The method of Claim 7 further comprising:
entering said determined geographic information regarding said track section occupied by said train in said geographic information system database before said displaying said geographic information regarding said track section occupied by said train.

11. The method of Claim 7 further comprising:
determining another track section occupied by said train;
determining geographic starting and ending positions of said another track section;

determining geographic information regarding said another track section occupied by said train from said geographic starting and ending positions of said another track section and from said geographic information system database; and

displaying said geographic information regarding said another track section occupied by said train.

12. The method of Claim 11 further comprising:
responding to an event defined by said determining another track section occupied by said train; and
displaying in about real-time said geographic information regarding said another track section occupied by said train.
13. The method of Claim 7 further comprising:
clearing another track section to be occupied by said train;
determining as a cleared track section said another track section;
determining geographic starting and ending positions of said cleared track section;
determining geographic information regarding said cleared track section from said geographic starting and ending positions of said cleared track section and from said geographic information system database; and
displaying said geographic information regarding said cleared track section with said displayed geographic information regarding said track section occupied by said train.
14. The method of Claim 13 further comprising:
displaying said geographic information regarding said track section occupied by said train in a first color; and
displaying said geographic information regarding said cleared track section in a second different color.
15. The method of Claim 13 further comprising:
planning a further track section to be occupied by said train;
determining as a planned track section said further track section to be occupied by said train;
determining geographic starting and ending positions of said planned track section;
determining geographic information regarding said planned track section from said geographic starting and ending positions of said planned track section and from said geographic information system database; and

displaying said geographic information regarding said planned track section with said displayed geographic information regarding said track section occupied by said train and with said displayed geographic information regarding said cleared track section.

16. The method of Claim 15 further comprising:

displaying said geographic information regarding said track section occupied by said train in a first color;

displaying said geographic information regarding said cleared track section in a second different color; and

displaying said geographic information regarding said planned track section in a third different color.

17. The method of Claim 7 further comprising:

including with said geographic information system database a roadway layer and a railroad layer;

entering said static roadway data in said roadway layer of said geographic information system database; and

entering said static track data in said railroad layer of said geographic information system database.

18. The method of Claim 17 further comprising:

including with said geographic information system database a train position layer; and

dynamically determining said geographic information regarding said track section occupied by said train; and

entering said dynamically determined geographic information in said train position layer of said geographic information system database.

19. The method of Claim 18 further comprising:

including with said geographic information system database at least one of a label layer and a landmark layer.

20. The method of Claim 18 further comprising:

determining when said train moves within a geographic area corresponding to said train position layer of said geographic information system database and responsively entering said dynamically determined geographic

information in said train position layer of said geographic information system database.

21. The method of Claim 7 further comprising:
employing said static roadway data for a predetermined municipality.
22. The method of Claim 7 further comprising:
determining said track section occupied by said train from a computer aided dispatching system.
23. The method of Claim 7 further comprising:
determining said track section occupied by said train at a present time.
24. The method of Claim 23 further comprising
determining as a cleared track section another track section cleared to be occupied by said train at a future time; and
displaying geographic information regarding said cleared track section with said geographic information regarding said track section occupied by said train.
25. The method of Claim 24 further comprising
determining as a planned track section a further track section planned to be occupied by said train at another future time; and
displaying geographic information regarding said planned track section with said geographic information regarding said cleared track section and said geographic information regarding said track section occupied by said train.
26. The method of Claim 7 further comprising:
overlaying said displayed geographic information regarding said static roadway data and said static track data from said geographic information system database with said displayed geographic information regarding said track section occupied by said train.
27. The method of Claim 7 further comprising:
employing with said displayed geographic information regarding said static roadway data at least one of a map of roadways, and a plurality of representations of location identifiers.

28. The method of Claim 27 further comprising:
employing a plurality of names as said representations of
location identifiers.
29. A geographic information system for displaying geographic
roadway data, geographic track data, and geographic position data for a train, said
geographic information system comprising:
 - a geographic information system database including static
roadway data and static track data;
 - means for determining a track section occupied by said train;
 - means for determining geographic starting and ending positions
of said track section;
 - means for displaying geographic information regarding said
static roadway data and said static track data from said geographic information system
database;
 - means for determining geographic information regarding said
track section occupied by said train from said geographic starting and ending
positions of said track section and from said geographic information system database;
and
 - means for displaying said geographic information regarding
said track section occupied by said train with said geographic information regarding
said static roadway data and said static track data.
30. The system of Claim 29 wherein said means for determining a
track section occupied by said train is a computer aided dispatching system; and
wherein said means for determining geographic starting and ending positions of said
track section includes a track infrastructure database.
31. The system of Claim 30 wherein said means for determining
geographic starting and ending positions of said track section further includes a
translation routine; wherein said track infrastructure database includes a plurality of
records, with one of said records being associated with a corresponding one of said
track sections, and further includes with each of said records a record identifier, an
identifier of said corresponding one of said track sections, a starting latitude, a starting
longitude, an ending latitude and an ending longitude; wherein said computer aided

dispatching system sends a message including an identifier of said track section to said translation routine; and wherein said translation routine responsively employs said identifier as a key to find one of said records in said track infrastructure database.

32. The system of Claim 31 wherein the static track data of said geographic information system database includes a plurality of representations of railroad tracks; wherein said means for displaying geographic information regarding said static roadway data and said static track data includes an image generator routine to display said static roadway data and said representations of railroad tracks; wherein said means for determining geographic information regarding said track section occupied by said train includes a train position routine, which receives from said translation routine said starting latitude, said starting longitude, said ending latitude and said ending longitude and responsively determines at least one of said representations of railroad tracks from said static track data of said geographic information system database; and wherein said means for displaying said geographic information regarding said track section occupied by said train displays a feature associated with said at least one of said representations of railroad tracks.

33. The system of Claim 32 wherein said geographic information system database includes a plurality of geographic information system maps associated with a plurality of corresponding geographic areas; and wherein said train position routine employs said starting latitude, said starting longitude, said ending latitude and said ending longitude to select one of said geographic information system maps on which to display said feature associated with said at least one of said representations of railroad tracks.

34. The system of Claim 33 wherein said means for displaying said geographic information regarding said track section occupied by said train includes a global communication network, a web browser and a display applet; and wherein said train position routine stores said feature in said geographic information system database and outputs a streaming vector corresponding to said feature over said global communication network to said display applet.

35. The system of Claim 34 wherein said display applet receives said streaming vector and displays a representation of said feature on a geographic information system map display.

36. The system of Claim 34 wherein said translation routine and said train position routine are part of a server; and wherein said web browser and said display applet are part of a client, which is interconnected with said server by said global communication network.

37. A geographic information system for displaying geographic roadway data, geographic track data, and geographic position data for a train, said geographic information system comprising:

 a geographic information system database including static roadway data and static track data;

 a computer aided dispatching system comprising means for determining a track section occupied by said train;

 a server comprising:

 a first routine adapted to determine geographic starting and ending positions of said track section,

 a second routine adapted to display geographic information regarding said static roadway data and said static track data from said geographic information system database, and

 a third routine adapted to determine geographic information regarding said track section occupied by said train from said geographic starting and ending positions of said track section and from said geographic information system database;

 a communication network; and

 a client system adapted to communicate with said server over said communication network, to receive and display said geographic information regarding said static roadway data and said static track data, and to receive and display said geographic information regarding said track section occupied by said train with said geographic information regarding said static roadway data and said static track data.

38. The system of Claim 37 wherein said computer aided dispatching system includes means for determining a cleared track section to be occupied by said train; wherein said first routine is further adapted to determine geographic starting and ending positions of said cleared track section; wherein said

third routine is further adapted to determine geographic information regarding said cleared track section from said geographic starting and ending positions of said cleared track section and from said geographic information system database; and wherein said client system is further adapted to receive and display said geographic information regarding said cleared track section to be occupied by said train with said geographic information regarding said track section occupied by said train.

39. The system of Claim 38 wherein said computer aided dispatching system further includes means for determining a planned track section to be occupied by said train; wherein said first routine is further adapted to determine geographic starting and ending positions of said planned track section; wherein said third routine is further adapted to determine geographic information regarding said planned track section from said geographic starting and ending positions of said planned track section and from said geographic information system database; and wherein said client system is further adapted to receive and display said geographic information regarding said planned track section to be occupied by said train with said geographic information regarding said cleared track section to be occupied by said train and with said geographic information regarding said track section occupied by said train.

40. The system of Claim 37 wherein said computer aided dispatching system includes means for sending a signal lamp planned message including an identifier of a signal lamp that said train is planned to pass; and wherein said first routine is further adapted to determine geographic starting and ending positions of a planned track section, which corresponds to said signal lamp.

41. The system of Claim 40 wherein said server includes a track infrastructure database having a plurality of records, with one of said records being associated with a corresponding one of said track sections, and with another one of said records being associated with said signal lamp, said another one of said records including an identifier of the record of said planned track section, which is associated with said signal lamp, said one of said records including a record identifier, an identifier of said corresponding one of said track sections, a starting latitude, a starting longitude, an ending latitude and an ending longitude; wherein said first routine employs said identifier of a signal lamp as a key to find said another one of said

records and input said identifier of the record of said planned track section; and wherein said first routine employs said identifier of the record of said planned track section as a key to find the record of said planned track section, in order to determine the starting latitude, the starting longitude, the ending latitude and the ending longitude thereof.